

Research Area:

Audio Video **Signal Processing**

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Topics

- ❑ Content Based Image and Video Indexing and Retrieval
- ❑ Image and Video Quality Assessment and Improvement

Motivations

❑ Content Based Image and Video Indexing and Retrieval

Multimedia applications over Internet, Mobile phones, DTV, imply a wide use of digital media ...

- How can we recover a specific picture or a videoclip from a large archive with myriad of pictures and videos?

❑ Image and Video Quality Assessment and Improvement

Objective

❑ Content Based Image and Video Indexing and Retrieval

To project and develop an experimental database for storing indexing and retrieval multimedia data (MPEG 7 standard compatible) as a testbed to assess content based automatic video processing techniques

❑ Image and Video Quality Assessment and Improvement

Topics

- ❑ Content Based Image and Video Indexing and Retrieval
- ❑ Image and Video Quality Assessment and Improvement

Motivations

□ Image and Video Quality Assessment and Improvement

Images or videos over the Internet, Mobile phones, DTV,

from the source to the final destination different steps of processing may introduce distortions and reduce the perceived quality:

- o delay, data-loss over the channel,...
- o environmental factors and cognitive characteristics of the users

Subjective image quality measures ----- expensive and not in real time

Objective image quality measures ----- crucial in many areas:

to develop and improve coding and restoring techniques;

to dynamically *monitor* and adjust image quality in broadcast and IPTV services

Subjective - Objective

- ❑ validation of objective measures by mean opinion score
- ❑ subjective perceptual quality measures with respect to the environment and cognitive characteristics of the user

Objectives

❑ **Image and Video Quality Assessment and Improvement**

The goal of our research is to develop

“ecological” innovative subjective metrics with cognitive tasks and environment simulation

quantitative measures that can automatically predict perceived image quality aiming to formulate a proposal for standard worldwide accepted metrics for quality classification of audio video material and for individuating the minimum quality level requirements for end users

Collaborative Efforts

- ❑ Laboratorio per la Valutazione della Qualità dei Servizi Multimediali
ISCTI – Comunicazioni- Ministero dello Sviluppo Economico
- ❑ Direzione Strategie Tecnologiche della RAI
- ❑ Facoltà di Scienza delle Comunicazioni dell'Università di Roma "La Sapienza"
- ❑ Dipartimento INFOCOM dell'Università di Roma "La Sapienza"

Objective - Subjective

High Quality HDTV signals

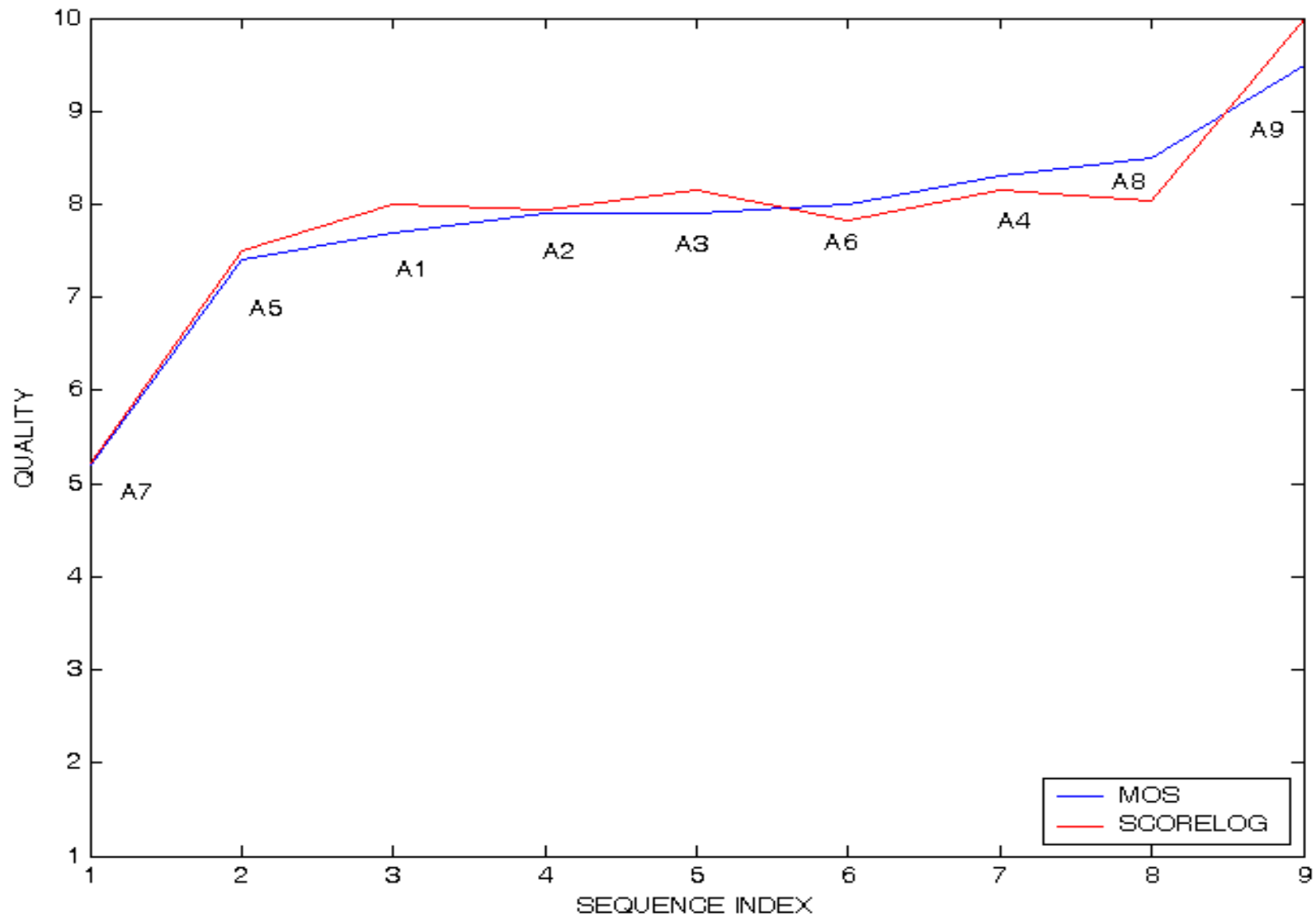
- ❑ **Objective:**

 - Wavelet based image analysis and Human Visual System Model

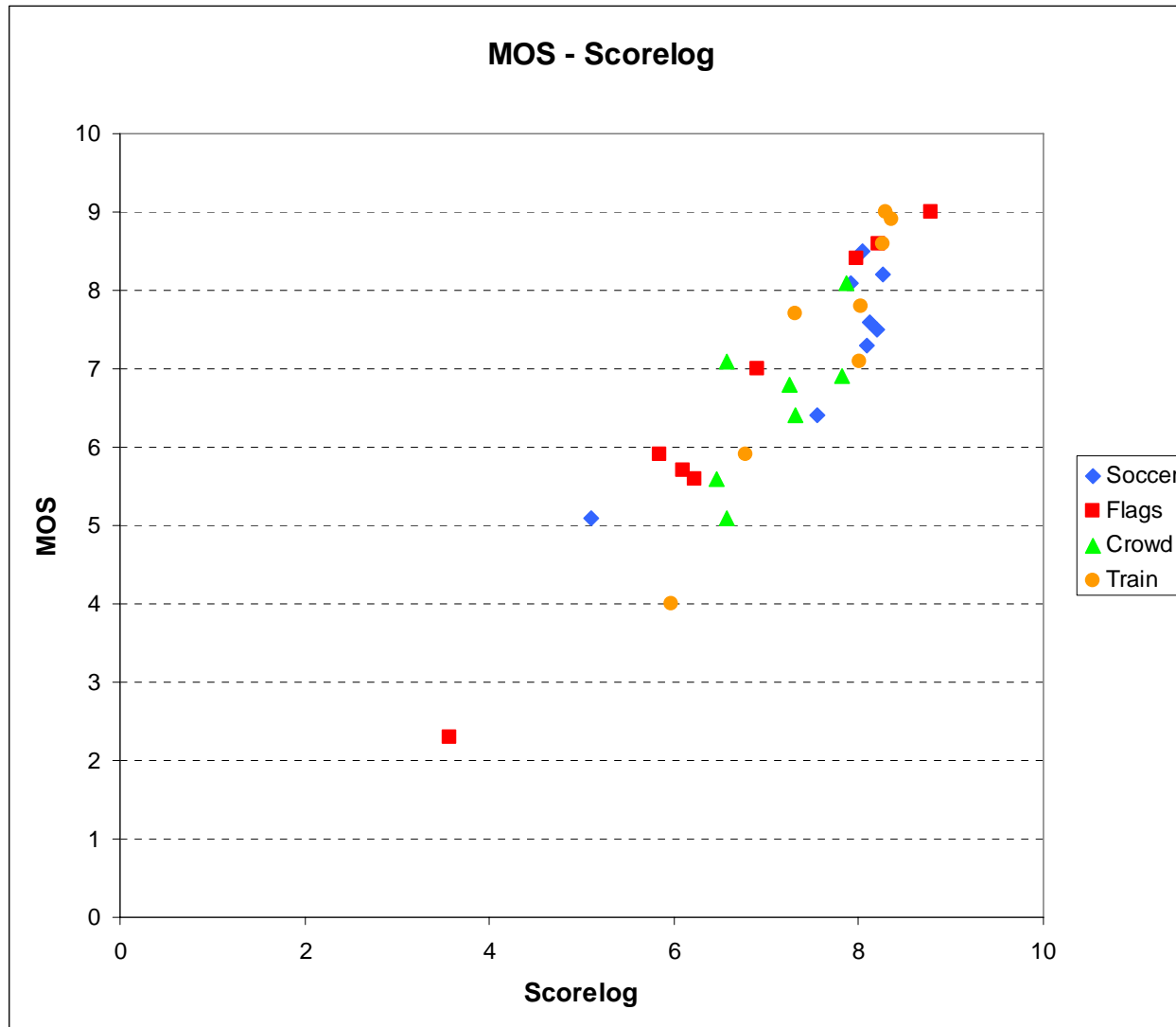
- ❑ **Subjective:**

 - ITU – 500 Recommendation and cognitive task

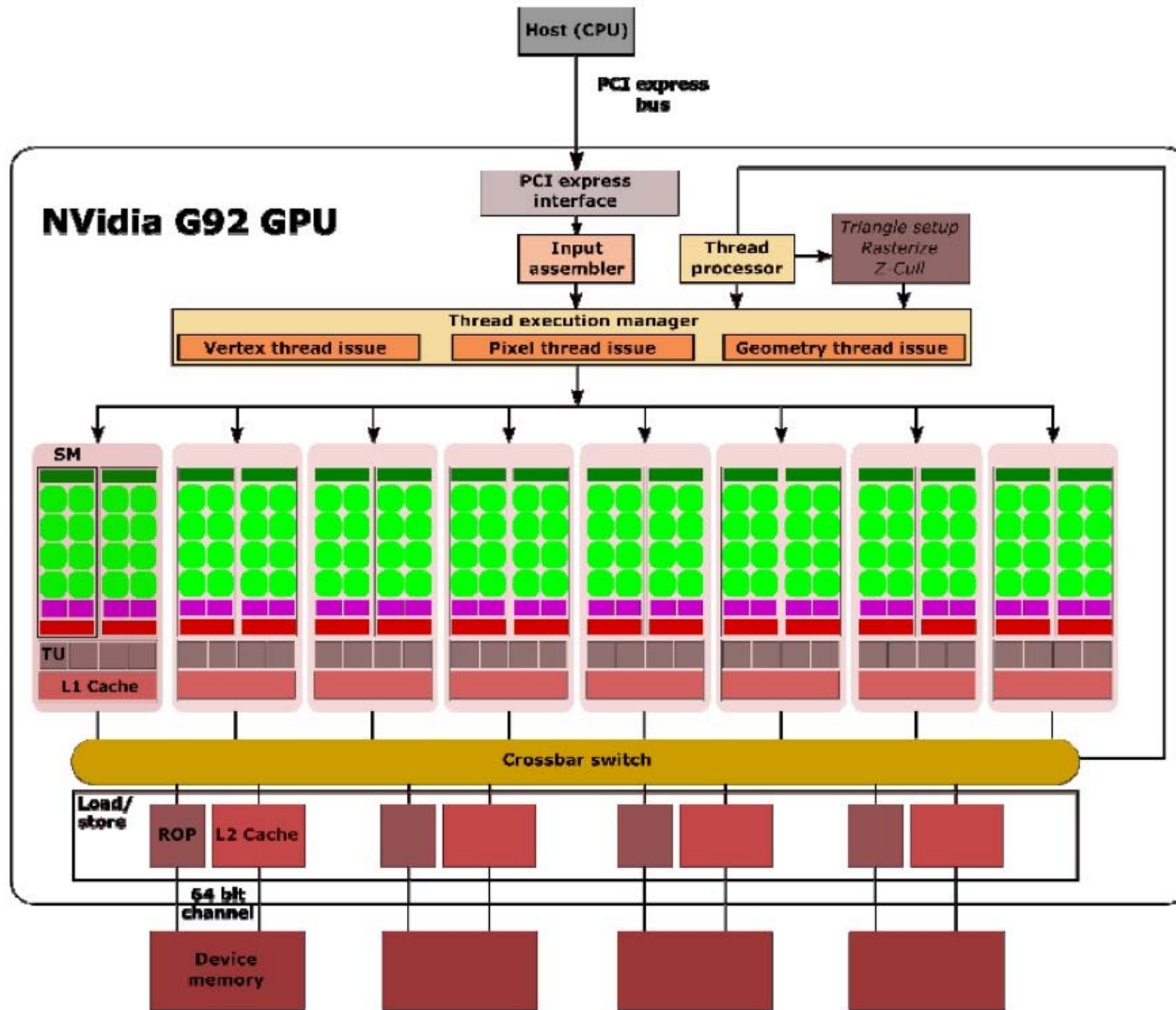
MOS – Objective metric



MOS – Objective Metric



Real Time



Future Work

Multimedia Context

- to what extent is the perceived audio quality of an audio visual stream influenced by the video quality?
- and vice versa
- how do audio and video quality contribute to the overall perceived audio visual quality?
- which are the more suitable metrics to answer the above questions?

more on: www.fub.it

Thanks for your attention